

GAV 2814 #
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Andreas Lenniger et al.

Applic. No. : 09/436,598

Filed : November 9, 1999

Title : Power Semiconductor Module With Ceramic
Substrate

Examiner : David E. Graybill

Group Art Unit : 2814

R E S P O N S E

Hon. Commissioner of Patents and Trademarks,
Washington, D. C. 20231

S i r :

Responsive to the Office action dated August 28, 2000, the
following remarks are made:

Reconsideration of the application is requested.

Claims 1 to 7 remain in the application.

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Initially, the Examiner stated that the IDS filed on November 9, 1999 did not contain a copy of JP7153906. An IDS including this reference is being filed concurrently with this response.

On page 2 to 3 of the above-identified Office action, claims 1 and 3 to 6 have been rejected as being fully anticipated by applicants' admitted prior art under 35 U.S.C. § 102.

As will be explained below, it is believed that the claims were patentable over the cited art in their original form and, therefore, the claims have not been amended to overcome the references.

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful. Claim 1 calls for, *inter alia*, a power semiconductor module, including:

semiconductor components;

a plastic housing having an interior and connecting element openings formed therein;

a substrate disposed in the plastic housing defining a housing base of the plastic housing, the substrate containing a ceramic plate having a top side and a bottom

side with a top metallization layer disposed on the top side and a bottom metallization layer disposed on the bottom side, the top metallization layer facing the interior of the plastic housing being patterned in order to form interconnects and equipped for and receiving the semiconductor components;

connecting elements interconnecting the semiconductor components; and

terminal elements for providing external terminals press-fitted into the connecting element openings in the plastic housing.

As described in the specification of the instant application, the power module according to the invention of the instant application differs from the prior art in that the terminals mentioned in claim 1 are press-fitted into the opening of the housing element. See last line of claim 1 and page 7, lines 16 to 25, of the specification of the instant application.

The Examiner seems to believe that this feature is present in the power modules according to the prior art mentioned by applicants in the specification of the instant application. However, applicants respectfully disagree with this conclusion.

The prior art cited in the introductory specification and the prior art references cited by the Examiner each describe power modules in which the terminal pins are injection-molded by a plastic during the production process. The disadvantage thereof is, as described on page 2, lines 1 to 13, of the specification of the instant application, that the terminal pins and the plastic have different expansion coefficients so that gaps between the plastic and the terminal pins can arise after the plastic material cools off. Such gaps lead to loose terminal pins. Such a disadvantage is, however, avoided with the power module according to the invention of the instant application because the terminal pins are not injection-molded with plastic. Rather, they are "press-fitted into . . . openings" of the power module housing during production. Such a process is neither disclosed nor suggested by the prior art upon which the application is based. Nor it is disclosed or suggested by the prior art cited by the Examiner.

Clearly, the prior art does not show the press-fitted terminal elements as recited in claim 1 of the instant application.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claim 1. Claim 1 is, therefore, believed to be patentable over the art. The

dependent claims are believed to be patentable as well because they all are ultimately dependent on claim 1.

Insofar as claim 1 is patentable, and due to the fact that claims 2 and 7 are ultimately dependent upon claim 1, applicants respectfully believe that the rejection of these claims under 35 U.S.C. § 103 is now moot.

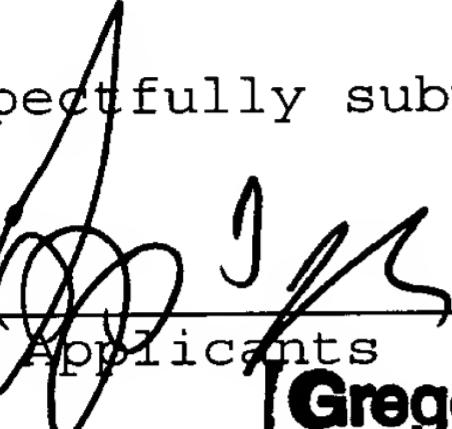
In view of the foregoing, reconsideration and allowance of claims 1 to 7 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.

Petition for extension is herewith made. The extension fee for response within a period of one (1) month pursuant to Section 1.136(a) in the amount of \$110.00 in accordance with Section 1.17 is enclosed herewith.

Please charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner and Greenberg, P.A., No. 12-1099.

Respectfully submitted,


For Applicants

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GLM:cgm
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